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Title:
Using Baseline Data to Predict Chronic PTSD 48-months After Mothers Report Intimate Partner Violence: Outcomes for Mothers and the Intergenerational Impact on Child Behavioral Functioning

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Abstract

Worldwide one in three women report intimate partner violence. Many of these women report long term mental health problems, especially PTSD, which is associated with negative problem solving, isolation, somatization, depression, and anxiety. Children are impacted by their exposure to domestic violence and experience internal (i.e., depression, anxiety) and external (i.e., hostility, delinquency) behavioral clinical problems. To predict which women will experience chronic PTSD symptoms, a PTSD predictor tool was developed and applied to PTSD symptom scores four years after 300 mothers with children (age 18 months to 16 years) received assistance for the violence. At four years, 266 (89%) of the 300 mother child dyads were retained. Of those, 245 met inclusion criteria for this study and 53% had scores above the clinical threshold for PTSD. The predictor tool performed well. There was a significant association, χ^2 (4) = 11.83, p = .019, *Cramer's V* = .229, between mothers predicted at low/some risk for chronic PTSD and scoring below the cut-off score for diagnostic PTSD symptoms at four years. Mothers predicted to be at extreme risk for chronic PTSD reported PTSD symptoms at or above the diagnostic level at 48 months. Children whose mothers had PTSD were at greater risk for Borderline/Clinical range behavioral problems compared to children whose mothers did not have PTSD. *Relative risk* values ranged from 2.07 (Externalizing) to 2.30 (Internalizing). When appropriate interventions are available, the PTSD predictor tool can assist with triage and guided referral of women at risk for chronic PTSD.

Globally, one in three women report intimate partner violence (World Health Organization (WHO), 2013). Rates of intimate partner violence experienced by women vary by country from 15% to 71% (Garcia-Moreno, Heise, Jansen, Ellsberg, & Watts, 2005). In the United States 27% of women report physical or sexual violence or stalking by an intimate partner, with significant short and long-term outcomes, including PTSD (Black et al., 2011). The long-term ill effects of post-traumatic stress disorder (PTSD) for individuals and their children are well established. Mothers who have experienced intimate partner violence are at risk for mental health disorders including PTSD, and their children are at risk for persistent psychological and behavioral problems (Asselmann, Wittchen, Lieb, Höfler, & Beesdo-Baum, 2014; Enlow et al., 2011; Brand, Schechter, Hammen, Brocque, & Brennan, 2011; Van Ee, Kleber, & Jongmans, 2015; Panter-Brick, Grimon, & Eggerman, 2014). Among women who seek safety at women's shelters, chronic PTSD (defined as lasting four or more months) is common. Johnson and Zlotnick (2012) reported that six months after seeking safe shelter, 46.8% of 147 women met diagnostic criteria for PTSD. Koci and colleagues (2014) reported that 39% of 287 mothers who sought safe shelter or a restraining order for intimate partner violence for the first time had PTSD symptoms above a clinical threshold 12 months later. There is a need for early identification of women at high risk for chronic PTSD following intimate partner violence to provide services to improve outcomes for the women and their children (National Institute for Mental Health (NIMH), 2011; Kessler et al., 2014).

Background

Predicting Chronic PTSD

In a prospective study (*n*=47,566), using WHO World Mental Health Surveys, Kessler et al. (2014) found that prior PTSD was the most powerful predictor of PTSD following a traumatic experience. Those with prior PTSD reported 3.5% of the traumatic events and 40.5% of the PTSD cases (*odds ratio* = 27.2). Additional predictors included other prior lifetime mental disorders, socio-demographic characteristics of the participants (higher risk for females and

young age), and the nature of the focal traumatic experience. Those who experienced interpersonal violence were at highest risk for PTSD. Kidnappings, beatings by a spouse or partner, rape, and sexual assault accounted for 6.8% of traumatic experiences and for 21.9% of PTSD cases. Kessler and colleagues' (2014) goal was to contribute to developing predictors to identify those at highest risk for chronic PTSD following traumatic experiences and selectively provide preventive interventions. They concluded that the development of a predictor tool was feasible and noted that significant predictors were likely to vary by population and the nature of the trauma, recommending that further work include an evaluation of complex interactions between the population of concern, the type of traumatic experience, and the screening settings. We have developed a PTSD predictor tool specific to mothers who experienced intimate partner violence and were screened when they first sought either safe shelter or a protection order from a district attorney's office. This paper describes the evaluation of that tool 48-months after baseline data were collected.

Chronic PTSD and Related Problems

Negative problem orientation is conceptualized as having dysfunctional cognitive-emotional tendencies that include appraising problems as threats, questioning ones' ability to solve problems, expecting poor outcomes from problem-solving, and readily becoming frustrated and discouraged when faced with a problem (D'Zurilla, Maydeu-Olivares, & Kant, 1998). Negative problem orientation is associated with PTSD (Beck et al., 2014). Reich, Blackwell, Simmons, and Beck (2015) found that among 105 women seeking mental health assessment following interpersonal violence, avoidance problem solving was a significant intermediary between abuse experiences and the severity of PTSD symptoms.

Marginalization is an individual's sense of engagement with others or sense of isolation from others and is associated with more symptoms of PTSD (Koci et al., 2012). Tangible support is also related to relationships with others. It is a particular aspect of social support. An individual with positive tangible support has a sense that there are others who can and will help

in specific ways, such as a providing immediate financial support or assistance with transport. Glass, Perrin, Campbell, and Soeken (2007) found that tangible support moderated the relationship between lifetime trauma experiences and PTSD symptoms (*N* = 76).

Mental health symptoms of somatization, depression, and anxiety are associated with PTSD symptoms. Chemtob, Griffing, Tullberg, & Ellis (2011) found that over 90% of 127 mothers receiving child welfare preventive services had experienced at least one traumatic event. Almost half (49%) had comorbid PTSD and depression. Resick, Williams, Suvak, Monson, & Gradus (2012) compared depression and PTSD symptom outcomes following treatment with either cognitive processing therapy or prolonged exposure therapy in 126 women survivors of rape, five to 10 years after the therapy. Over 85% of the women experienced lasting improvements in PTSD and depression symptoms.

Mother's Chronic PTSD Symptoms and Child's Risk for Behavioral Problems

In 2002, in the US, an estimated 15.5 million children lived in families where one or more episodes of intimate partner violence occurred in the past year. Almost half of the violence episodes were severe (Whitfield, Anda, Dube, & Felitti, 2003). An association between child exposure to intimate partner violence and child internalizing and externalizing problems is well established (Jouriles, Rosenfield, McDonald, & Mueller, 2014). Women who experience partner violence and have PTSD are more likely than similar women without PTSD to return to the abuser, risking exposing the children to more violence (Bell, Cattaneo, Goodman, & Dutton, 2008). They are also more likely to lack economic resources (Ham-Rowbottom, Gordon, Jarvis, & Novaco, 2005) and stable housing (Rollins et al., 2012). They are likely to be less sensitive and less emotionally available (Van Ee et al., 2015). Children whose mothers have experienced partner violence and have PTSD are more likely than similar children whose mothers do not have PTSD to have internalizing and externalizing behavior dysfunctions (Symes, McFarlane, Fredland, Maddoux, and Zhou, 2016).

Aims

The first aim of the study was to evaluate and validate a tool to predict chronic PTSD symptomatology using data collected at entry into the study. The second aim was to identify the association of chronic PTSD with other key outcomes, including thinking style, self-efficacy, mental health symptoms, and social support for the mothers. The third aim was to identify the association of mother's chronic PTSD with child behaviors 48 months after mothers first sought safe shelter or a protection order for partner violence.

Method

Procedures and Sample

Data for this study were originally collected for an ongoing 7-year, prospective, cohort study (*N*=300 mother-child dyads). The study was approved by an institutional review board. Participants were mothers who sought safe shelter or applied to the District Attorney's office for a protective order for the first time and who had a child between 18 months and 16 years of age. If the mother had more than one child between 18 months and 16 years of age, the index child was selected randomly. A full description of the parent study, including measures, recruitment procedures, and a description of the sample, is available (McFarlane, Nava, Gilroy, Paulson, Maddoux, 2012).

At 48 months 266 mother-child dyads (89%) with complete data remained in the study. Of those, 21 mothers did not meet the cut-off symptom score for clinical PTSD at baseline and were not included in this analysis. Of the 245 remaining dyads, 120 (49%) mothers had PTSD scores below the cut-off for clinical PTSD, and 125 (51%) of the mothers had PTSD scores at or above the clinical threshold (Table 1). A summary of key demographic information is outlined in Table 1. In order to retain the highest number of participants across analyses, any missing data were removed pairwise (available-case analysis), resulting in a varying sample size across each individual analysis at 48-months.

Measures

Information about the instruments is provided in a brief summary. For a more complete discussion see McFarlane et al. (2012).

The Post-Traumatic Stress Disorder Screen (Breslau, Peterson, Kessler, & Schultz, 1999) is a 7-item screen with an established cut-off score of four or greater indicating PTSD. Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .700).

The PTSD Predictor Tool (Symes, Maddoux, McFarlane, & Pennings, 2016) uses baseline data to arrive at one of five risk categories for chronic PTSD: No/Minimal Risk, Low/Some Risk, Moderate Risk, High Risk, Extreme Risk. Initial assessment of this tool found adequate specificity and sensitivity of the risk predictor tool 16 months after mothers first sought help. Four scales, totaling 39 items, make up the predictor tool. The scales include General Self-Efficacy (Table 2, Schwarzer & Jerusalem, 1995), Adverse Childhood Experiences (Table 3, Centers for Disease Control and Prevention,1997; 2010), Tangible Social Support (Table 4, Norbeck, Lindsey & Carrieri, 1981), and PTSD screen (Table 4, Breslau, Peterson, Kessler, & Schultz, 1999). The tool was originally designed for paper and pencil administration. It has now been adapted into a mobile application termed FAST (First Assessment Screen Tool) that is available in English and Spanish at no cost from Google and Apple. The FAST application determines risk for chronic PTSD at the time an individual reports partner violence. Front line providers and para-professionals can easily administer the tool.

The Brief Symptom Inventory (BSI; Derogatis & Lazarus, 2001) is an 18-item scale measuring specific forms of psychological distress, depression, anxiety, and somatization, and measuring overall psychological distress with the global severity index. *Internal consistency reliability* ranges from 0.74 to 0.89 on the subscales.

The Achenbach Child Behavior Checklists, Age 1.5 to 5 years and Age 6-18 years (CBCL) are standardized instruments that assess children's behavior problems and social competencies. To assess child behavior the CBCLs are orally administered to a parent who rates the presence and frequency of certain behaviors on a 3-point scale (0=not true, 1=somewhat or sometimes true, and 2=very true or often true). The CBCL consist of two broadband factors of behavioral problems: internalizing and externalizing, with mean scale scores for national normative samples as well as for clinically referred and non-referred samples of children. Extensive psychometric testing has yielded favorable information regarding the tool's validity and reliability in English and Spanish (Achenbach & Rescorla, 2000). For this study, raw scores were converted into standard scores based on child age and gender and coded into clinical levels (e.g., Normative, Borderline, Clinically Significant levels). Due to unequal group sizes, children with non-normative scores were collapsed into one group (e.g., Borderline/Clinical levels). Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .770).

The 10-item *General Self-Efficacy Scale* (GSE; Schwarzer & Jerusalem, 1995) assesses for a general sense of perceived self-efficacy to predict coping and adaptation after stressful life events. Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .850).

The *Safety Behavior Checklist* is a 7-item safety survey used to assess present use of safety behaviors and chart future adoption (McFarlane, Parker, & Cross, 2001). Internal consistency of safety behaviors was observed as low across time points (~.600); however, given the nature of items and previously established validity, these items were retained for analysis.

The *Norbeck Social Support* (Norbeck, Lindsey, & Carrieri, 1981) is a 6-item instrument that measures multiple components of social support including functional properties of social support (e.g., emotional and tangible support) and network properties (e.g., stability of

relationships, frequency of contact), as well as the amount of support from specific sources (e.g., relatives, friends). For this study only tangible support was considered. Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .800).

The 25-item *Social Problem-Solving Inventory - Revised Short* (SPSI-R: S; D'Zurilla, Nezu, & Maydeu-Olivares, 2002) assesses problem solving for everyday situations. It includes five subscales that measure either adaptive or dysfunctional problem solving. Higher scores indicate better functioning in problem solving. Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .800).

The 5-item *Koci Marginality Index* (KMI; Koci et al., 2012) uses a 5-point Likert scale to assess women's marginality, the perception of living on the periphery of the social center. Across time points, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .800).

The 19-item *Danger Assessment Scale* (DAS; Campbell, 1986) is designed to assist women in determining their potential risk for becoming femicide victims. Weighted scoring results in four ranges of danger: Less than 8=Variable Danger; 8-13=Increased Danger; 14-17=Severe Danger; and 18 or more=Extreme Danger. Across timepoints, internal consistency of these items was in the acceptable range (*Cronbach's alpha* > .650).

The 47-item *Severity of Violence Against Women Scale* (SAVAWS; Marshall, 1992) measures threats of abuse (19 items) and physical abuse (28 items). Physical abuse items include six items on sexual abuse, scored separately. For this study, Coefficient alpha was 0.95 for the total scale, 0.90 for Threats of Abuse Subscale, 0.93 for Physical Abuse Subscale, and 0.84 for Sexual Abuse Subscale. At baseline, threat scores ranged from 19 to 76 (M = 41.78, SD = 13.32), sexual abuse ranged from 6 to 22 (M =8.32, SD = 3.64), and physical abuse scores ranged from 21 to 78 (M = 36.52, SD = 13.88).

Data Analysis

To assess the accuracy of baseline PTSD risk categories in predicting clinically significant levels of PTSD at 48-months, a series of cross tabulations with Pearson's chi square were computed. For 2x2 contingency tables, such as the relationship between clinically significant levels of PTSD and clinically significant levels of child behavioral problems, relative risk ratios were computed. To examine differences in outcomes by clinically significant levels of PTSD, a series of one-way analysis of variance (ANOVA) tests were computed. Multiple pairwise comparisons were chosen over multivariate approaches, such as multivariate analysis of variance (MANOVA) tests, because of differences in metric and outcome domain across measures. An *alpha* level of .05 was retained across all analyses and a Bonferroni adjustment was not done due to the *a priori* nature of all test hypotheses. All analyses were computed in SPSS v. 21.

Results

A summary of the 48-month PTSD symptoms (below Clinically Significant, at/above clinically significant), by baseline PTSD risk is shown in Table 6. There was a significant association, χ^2 (4) = 11.83, p = .019, *Cramer's V* = .229, with a greater proportion of those in the low/some risk category having PTSD symptom scores below the cut-off, a low likelihood of diagnostic levels PTSD symptoms. Conversely, a greater proportion of participants from the extreme risk category had PTSD symptoms at or above the diagnostic level at 48-months. These results support the validity of the predictor tool over a four year period.

Maternal factors by PTSD trajectory are outlined in Table 7. Women who had PTSD at 48-months had significantly higher levels of the following factors compared to those whose scores below the cut-off for PTSD: negative problem solving, safety behaviors, marginalization, threats, danger, somatization, depression, and anxiety. Conversely, those with scores were below the cut-off for PTSD had significantly greater levels of Self-Efficacy and Tangible Support compared to those with score at or above the cut-off for PTSD.

Results of the intergenerational impact of mothers' chronic PTSD on child functioning are shown in Table 8. Children whose mothers had PTSD were at greater risk for Borderline/Clinical range behavioral problems compared to children whose mothers did not have PTSD at 48-months. *Relative risk* values ranged from 2.068 (Externalizing) to 2.297 (Internalizing).

Discussion

Over half of the mothers (119 of 225 (53%), Table 6) who sought help for intimate partner violence had PTSD four years later. We believe this is the first time that a tool designed to predict chronic PTSD has been evaluated to determine its effectiveness in predicting chronic PTSD four years after individuals seek help for partner violence. When considering the results (table 7) it is noteworthy that for those in the small/no risk group (*n*=5) there were two who went on to experience PTSD. Our analysis for this study did not include data for trauma subsequent to the baseline report of partner violence, which may contribute to the results. Those in the low/some risk were significantly more likely to be in the group who did not have PTSD, but some did have chronic PTSD. Those in the moderate risk groups were almost equally likely to be in either group. Those in the high-risk group were more likely to have chronic PTSD, although the differences in the two groups for this category were not statistically significant. Finally those in the extreme risk group were significantly more likely to have chronic PTSD. These findings provide support for the discrimination of the tool over time. Group membership was almost exactly as predicted, with the exception of the no/minimal risk category. For the moderate risk (middle) group the almost equal division into the groups and the lack of significant difference between the groups with and without PTSD is consistent with the prediction of moderate risk.

One limitation of this study is that the statistical analysis was conducted on the same sample that the tool was developed with, raising the possibility that the results are not generalizable. Another limitation is that PTSD status (yes or no) was determined using a screening tool rather than a gold standard diagnostic tool. However, the Breslau PTSD Screen

has been established to reliably identify clinical level PTSD symptoms that meet the criteria for PTSD according to the Diagnostic and Statistical Manual IV (DSM-IV, Bohnert & Breslau, 2011) criteria for PTSD. This study began while the DSM-IV was in effect.

The findings about the maternal factors associated with chronic PTSD are consistent with previous research, and support the great need for interventions to decrease PTSD and associated problems. Select forms of cognitive therapy may reduce negative problem orientation and increase safety behaviors and a sense of self-efficacy. We cannot say with certainty that the association of tangible support with better outcomes is linked to participants' poverty because the majority of the participants lived in poverty, but that is likely. There is a need for policies that provide support to families so that their circumstances do not result in further trauma or in chronic PTSD. Mothers with clinical levels of PTSD may continue to experience high danger (Table 6). Especially concerning are the higher danger scores for mothers with PTSD, as well as their increased use of safety behaviors, which may indicate an attempt to protect themselves and their children. Interventions that establish safety for women and their children are needed. These findings reinforce the need for continued clinical assessment of danger risk and concurrent advocacy and counseling on safety measures.

Previous research documents personal factors that are related to the risk for repeated victimization. These factors include safety behaviors (Parker & Gielen, 2014), self-efficacy, and external factors such as threats and danger (Hegarty et al., 2015). Repeated victimization, such as threats of harm and being in danger, may increase the toxic effects of the initial trauma (Blanch, Shern, & Steverman, 2014). There is a need to support mothers who are making decisions to leave, or are leaving, a violent partner so that they can make the best decisions in the face of threats and danger. The Identification and Referral to Improve Safety (IRIS) trial is an ongoing evaluation of an online program to aid women in making decisions related to safety. Initial results indicate that women who used the program experience reduced decisional conflict (Eden et al., 2015). The I-Decide trial in New Zealand is also designed to evaluate an online tool

to support safety decisions and also to improve self-efficacy and reduce depressive symptoms for women who experience partner violence (Tarzia et al., 2015). IPV advocacy alone is unlikely to reduce chronic PTSD. In the advocacy-alone arm of a trial (Brierley, 2013) of a psychological intervention for women entering shelter or community based support programs, 61% of the 87 women in that group had persistent PTSD symptoms above the clinical threshold after one year (Feder, under review).

As expected, child behavioral function continues to be associated with mothers' PTSD status. This finding highlights the importance of interventions to reduce or manage maternal PTSD symptoms to improve child function. One limitation is that the data about child function were collected from mothers and not from objective or independent sources, however the CBCL is a robust, validated tool that has been used in studies of children exposed to IPV (Jouriles, Rosenfield, McDonald, & Mueller, 2014).

Conclusion

Even 48 months after mothers first sought help for partner violence our tool shows promise in predicting the likelihood of chronic PTSD in one cohort of women who have experienced IPV. While, the predictor tool needs to be tested in other cohorts and using a gold standard for PTSD diagnosis, our results suggest that it will help meet the need for early identification of those at highest risk of chronic PTSD. Our identification of factors associated with chronic PTSD can inform future interventions for this at risk population. The persistent association of maternal PTSD with children's behavioral problems suggests that interventions for children exposed to IPV need to take into account their mothers' mental health.

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